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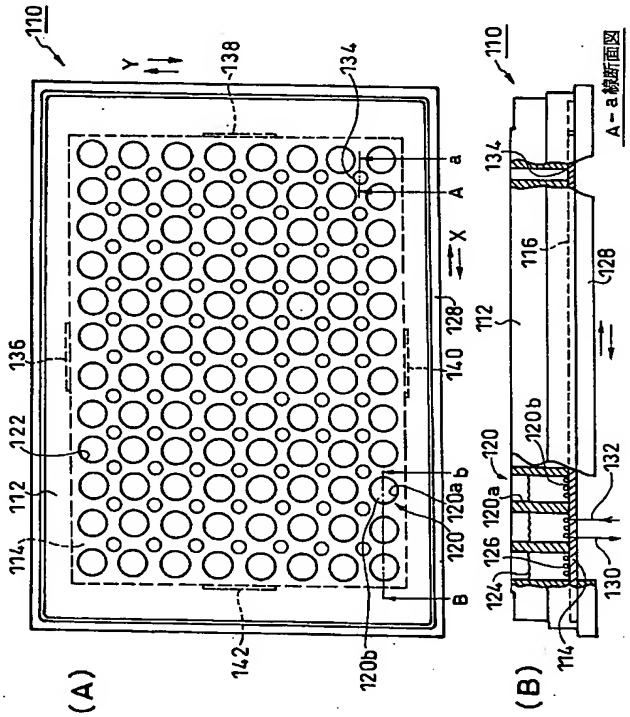
(54)【発明の名称】　細胞培養容器

(57)【要約】
【課題】　本発明の目的は、製造が効率的に行なえ、且つ細胞の培養と観察が適正に行なえる多穴細胞培養容器を提供することにある。
【解決手段】孔１２２が複数設けられた本体１１２と、光学的に透明な材質で構成され該本体１１２下部に該各孔１２２を閉口し各対応凹部１２０を構成するように設けられた一枚の底板１１４と、該本体１１２と底板１１４の間に該凹部１２０の構成部分を除いて固まっていない状態で設けられ、その後の固まった状態で該本体１１２と該底板１１４を該凹部１２０に液漏れが生じないように固定する接着剤１１６と、該凹部１２０を構成する部分の間に設けられ、該固まっていない状態の接着剤１１６で密着させた際、該本体１１２と底板１１４間の気泡ないし余分な接着剤を該接着剤１１６が固まる前に外部へ抜く抜孔１３４と、を備えたことを特徴とする細胞培養容器１１０。



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【特許請求の範囲】

【請求項１】　細胞を収容し、該細胞の培養と観察が可能な凹部が複数設けられた多穴型の細胞培養容器であって、

孔が複数設けられた本体と、

光学的に透明な材質で構成され、前記本体の下部に、前記各孔を閉口し各対応凹部を構成するように設けられた一枚の底板と、

前記本体と前記底板の間に、前記凹部を構成する部分を除いて固まっていない状態で設けられ、その後の固まった状態で該本体と該底板を該凹部に液漏れが生じないように固定可能な接着剤と、

前記本体ないし底板の凹部を構成する部分と凹部を構成する部分の間に設けられ、該本体と該底板の間を固まっていない状態の前記接着剤で密着させた際、該本体と該底板の間の気泡ないし余分な該接着剤を該接着剤が固まる前に外部へ抜くことが可能な抜孔と、

を備えたことを特徴とする細胞培養容器。

【請求項２】　請求項１記載の細胞培養容器において、

前記底板を、光学的に透明な及び実質的に蛍光性を有さない材質で構成し、

前記本体に前記抜孔を設け、

前記凹部の上方より、ないし底部を介して該凹部内の細胞の観察が行なわれることを特徴とする細胞培養容器。

【請求項３】　請求項１又は２記載の細胞培養容器において、

前記抜孔は、前記本体ないし底板に前記各凹部の外周囲に沿って設けられることを特徴とする細胞培養容器。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は細胞培養容器、特に多穴型細胞培養容器の製造手法の改良に関する。

【０００２】

【従来の技術】多穴型容器（マイクロプレート）は、主に試料の定量測定用に使用されている。その材質は光学的に透明な材質で構成され、安価、割れ難く加工し易い、例えばポリスチレン、ＭＣナイロン等のプラスチック、硬質ガラスが主であるため、細胞の培養と観察を行なう細胞培養容器として使用するには、測定精度の観点から満足のゆくものではなかった。

【０００３】すなわち、細胞培養容器の材質には一般的なプラスチック、硬質ガラスを用いることが最も一般的であるが、これらの材質自体も微弱であるが、蛍光を発している。一方、培養細胞自体の蛍光強度は、もともと非常に微弱であるため、培養細胞の微弱蛍光を測定するとき、該培養細胞の微弱蛍光と細胞培養容器から発せられる蛍光が重なり、培養細胞からの真の蛍光強度が正確に測定できなかった。

【０００４】また、凹部の側部と底部が一体的に形成されたマイクロプレートを作るには、特に底部の加工が難

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しく、このため、通常、底部の厚さが１ｍｍ以上ある場合が多い。しかしながら、例えばレーザ共振点顕微鏡法では底部の厚さが例えば、０．１７ｍｍ以下等でないと使用できない場合がある。また、前述のような一般的なプラスチック、硬質ガラス製のマイクロプレートでは、例えば３００ｎｍ以下等の波長の光を通さない場合が多い。しかしながら、例えば３００ｎｍ以下等の波長で測定する必要がある場合がある。

【０００５】ところで、これらの問題の解決手段のヒントとして、凹部の側部と底部を別個に作り、底部を無蛍光性の材質で構成することにより、細胞の培養と観察が可能にした一穴型の細胞培養容器がある。この一穴型の無蛍光性を有する細胞培養容器は、無蛍光性底板が高価、割れ安く加工し難い等の理由から、通常、底部のみに無蛍光性底板が用いられ、側部は安価、割れ難く加工し易いプラスチック等の材質で作り、これらを接着剤により接着固定してつくられることが多い。

【０００６】この細胞培養容器により、細胞の培養と観察が容易となり、特に無蛍光性の材質で構成された底部を用いることにより、底部を介して凹部内での培養細胞から発せられる微弱蛍光をより正確に測定することが可能となる。

【０００７】

【発明が解決しようとする課題】しかしながら、一穴型の無蛍光性の細胞培養容器のつくり方をそのまま多穴型の細胞培養容器に適用するには困難があった。すなわち、多穴型細胞培養容器のつくり方としては、本体の各孔に底板をそれぞれ一枚ずつ接着する方法、本体の各孔に一枚の底板を接着する方法等が考えられる。しかしながら、本体の各孔に底板をそれぞれ一枚ずつ接着する方法では、生産効率が悪く、コストが高くなる。

【０００８】一方、本体の各孔に一枚の底板を接着する方法では、生産効率が非常に良く、均一な材質のものが接着できる。またコストも大幅に低減できる利点がある。しかしながら、この場合、使用時に液漏れが生じる、細胞の培養が良好に行なえない、培養細胞を容器に入れたまま、測定が適正に行なえない場合がある等の問題があり、その原因についても未だ不明であった。

【０００９】本発明は前記従来技術の課題に鑑みなされたものであり、その目的は多穴型の製造が効率的に行なえ、且つ細胞の培養と観察が適正に行なえる細胞培養容器を提供することにある。

【００１０】

【課題を解決するための手段】本発明者らは、前記問題について鋭意検討を行なった結果、それらの原因が本体と底板の接着の良し悪しにあることを見つけた。すなわち、無蛍光性の材質は、高価、割れ安く加工し難いため、無蛍光性を有する多穴型の細胞培養容器をつくる際は、通常、無蛍光性の材質は底板のみに用いられ、本体は、安価、割れ難く加工し易いプラスチック等の材質を

用いる。そして、これらを接着剤により接着してつくる方法が考えられる。

【００１１】図１にはこのようにしてつくられた従来の多穴型細胞培養容器１０を上方より見た図が示されている。この本体１２と底板１４の接着時、図１に示すように接着剤１６から小さな気泡１８が発生する場合がある。本体１２と底板１４の間に気泡１８が残ると、本体１２の孔２２により構成される凹部２０の側部２０ａと、底板１４により構成される凹部２０の底部２０ｂが完全密着の接着にはならない場合がある。

【００１２】このため、使用時、凹部２０から培養液等の液漏れ等が発生する場合があることを見つけた。また、この接着時に、余分な接着剤１６が凹部２０内へ流れ込む場合があり、接着剤１６が凹部２０内へ流れ込むと、培養時、接着剤１６中に含まれる成分が培養液に溶け込む場合があり、これが細胞の培養に悪影響を及ぼす場合がある。

【００１３】また、測定時、凹部２０上に接着剤１６があると、培養面積が接着剤によって狭くなり細胞の発育の妨げになる場合がある。そして、本発明者らは、本体１２と底板１４の接着時において、接着剤１６から発生する気泡を外部に取除き、また余分な接着剤を外部に取除き、凹部へ流れ込むのを防ぐことにより、一穴型の無蛍光性の細胞培養容器のつくり方を多穴に適用した場合であっても、従来極めて困難であった、培養時の液漏れ防止、細胞の良好な培養、培養細胞を凹部に入れたまま、測定が適正に行なえることを見出し、本発明を完成するに至った。

【００１４】すなわち、前記目的を達成するために本発明にかかる細胞培養容器は、細胞を収容し、該細胞の培養と観察が可能な凹部が複数設けられた多穴型の細胞培養容器であって、本体と、一枚の底板と、接着剤と、抜孔と、を備えることを特徴とする。ここで、前記本体は、孔が複数設けられる。

【００１５】また、前記底板は、光学的に透明な材質で構成され、前記本体の下部に、前記各孔を閉口し、各対応凹部を構成するように設けられる。前記接着剤は、前記本体と底板の間に、前記凹部を構成する部分を除いて固まっていない状態で設けられ、その後の固まった状態で該本体と該底板を該凹部に液漏れが生じないように固定可能とする。

【００１６】前記抜孔は、前記本体ないし前記底板の前記凹部を構成する部分と前記凹部を構成する部分の間に設けられ、該本体と該底板の間を固まっていない状態の前記接着剤で密着させた際、該本体と該底板の間の気泡ないし余分な該接着剤を該接着剤が固まる前に外部へ抜くことを可能とする。ここにいう観察とは、凹部の底部の上方ないし下方よりの目視、顕微鏡観察は勿論、光学測定装置による光学測定を含めていう。

【００１７】本発明では、培養液として有機溶媒の使用も考えられるので、接着剤としては、例えば有機溶媒に溶けないもの、培養細胞に対し広く毒性が認められないものが好ましく、例えば合成ゴムの変性体である、メタクリル酸エステルを主成分としたもの等が一例として挙げられる。

【００１８】また、ここにいう本体と底板の間の気泡ないし余分な接着剤を接着剤が固まる前に外部に抜くとは、気泡だけが発生した場合は該気泡だけが抜けてもよいし、或いは気泡が発生していない場合は、余分な接着剤だけが抜けてもよいし、気泡と余分な接着剤が共に抜けることも意味する。なお、本発明においては、前記底板を、光学的に透明な及び実質的に蛍光性を有さない材質で構成し、前記本体に前記抜孔を設け、前記凹部の上方より、ないし底部を介して該凹部内の細胞の観察が行なわれることが好適である。

【００１９】ここにいう無蛍光性とは、全く蛍光が発せられないものであれば非常に理想的であるが、全く蛍光が発せられないものをつくることは現実的には難しい。このため、僅かに蛍光が発せられるが、この蛍光強度が培養細胞の真の微弱蛍光強度を測定するのに影響しない程度に非常に低いものをも含めていう。その作り方としては、例えば天然の二酸化ケイ素から化学的プロセスにより塩化ケイ素を合成し、この高純度の塩化ケイ素を主原料として、合成石英を作ることが一例として挙げられる。

【００２０】このようにしてつくられた合成石英は、一般的なプラスチック、硬質ガラスに比較し自蛍光が非常に低いことに加えて、波長が１９０ｎｍ以上の光透過率が非常に高い、激しい温度変化にも耐えられる利点があるので、細胞の培養と観察を行なう本発明の細胞培養容器の材質として好ましい。例えば、凹部の蛍光強度比は、入射光強度に比較し例えば１０％以下が一例として挙げられる。また、本発明においては、前記抜孔を、前記本体ないし底板に各凹部の外周囲に沿って設けることも好適である。

【００２１】

【発明の実施の形態】図２（Ａ）には本発明の一実施形態にかかる多穴型細胞培養容器の要部拡大図（縦断面図）、同図（Ｂ）は同様の多穴型細胞培養容器の要部を上方より見た図である。なお、前記従来技術と対応する部分には符号１００を加えて示し説明を省略する。

【００２２】同図に示す本実施形態にかかる多穴型細胞培養容器１１０は、本体１１２と、底板１１４と、接着剤１１６と、気泡抜孔（抜孔）１３４を備える。ここで、前記本体１１２は、例えばポリスチレンの材質で構成され、孔１２２が複数設けられている。また、前記底板１１４は、光学的に透明で及び無蛍光性の合成石英板で構成され、前記本体１１２の下部に、前記各孔１２２を閉口し、各対応凹部１２０を構成するように設けられている。

【００２３】前記接着剤１１６は、本体１１２と底板１１４の間に、該凹部１２０を構成する部分を除いて固まっていない状態で設けられ、その後の固まった状態で該本体１１２と該底板１１４を該凹部１２０に液漏れが生じないように固定可能とする。前記気泡抜孔１３４は、本体１１２の凹部１２０を構成する部分と凹部１２０を構成する部分の間に設けられ、該本体１１２と該底板１１４の間を固まっていない状態の接着剤１１６で密着させた際、該本体１１２と底板１１４の間の気泡ないし余分な接着剤を、該接着剤１１６が固まる前に外部へ抜くことが可能とする。

【００２４】そして、前記接着剤１１６は、例えば本体１１２に底板１１４を密着させて、該本体１１２と底板１１４の間に生じた気泡や、余分な接着剤１１６が、前記気泡抜孔１３４より外部へ抜けた後、光照射により短時間で硬化するものを用いており、本体１１２と底板１１４を光学接着している。つぎに、図３（Ａ）には本発明の一実施形態にかかる多穴型細胞培養容器の全体を上方より見た図が示され、同図（Ｂ）には同様の多穴型細胞培養容器を側方より見た部分断面図が示されている。

【００２５】同図に示すように本実施形態にかかる多穴型細胞培養容器１１０は、外形が、例えば長手方向が約１２７．６ｍｍ、短手方向が約８５．３ｍｍ程度で構成され、複数の凹部１２０が設けられている。この各凹部１２０の側部１２０ａは、例えばポリスチレン製本体１１２に設けられた、例えば直径約６．４５ｍｍ程度の各孔１２２により構成され、その底部１２０ｂは、板厚が例えば約０．１５ｍｍ程度の、一枚の無蛍光性合成石英板（底板）１１４で構成される。

【００２６】この各凹部１２０内は、培養液１２４で満たされ、各凹部１２０内で細胞１２６が培養される。そして、細胞の培養が終了した時点は勿論、その培養途中であっても、本実施形態にかかる細胞培養容器１１０を、そのまま例えば細胞内イオン測定装置のサンプル台１２８に載せ、例えば各凹部１２０内の培養細胞１２６のカルシウムイオン濃度等を、順次測定することが可能となる。すなわち、サンプル台１２８は、本実施形態にかかる多穴型細胞培養容器１１０を例えばＸＹ方向に移動できるようになっており、所定の測定位置となる光路上に各凹部１２０をセットし、該各凹部１２０での培養細胞１２６の測定を順次行なう。

【００２７】例えば細胞内イオン測定装置の光照射手段（図示省略）からの所定波長の励起光１３０が細胞培養容器１１０の下方より入射され、その底板１１４を介して凹部１２０内の培養細胞１２６に照射される。すると、培養細胞１２６からは蛍光が発せられ、そのうち、底板１１４を介して下方に出射された蛍光１３２は、後段の検出手段（図示省略）に入射され、公知の信号処理が行なわれ、例えば該凹部１２０での培養細胞１２６内のカルシウムイオン濃度等が測定される。

【００２８】次いでサンプル台１２８を移動し、他の凹部、例えば同列の隣りの凹部を前記測定のための光路上に位置させ、測定を行ない、この操作を複数の凹部について繰返し行なうことにより、一穴型の細胞培養容器を複数個交換しながら測定した場合に比較し、容器の交換作業等が省かれるので、同一個数の凹部の測定であっても、その作業がより効率的に行なえる。

【００２９】ここで、各凹部１２０の底部１２０ｂを構成する底板１１４は、実質的に蛍光性を有さない合成石英板１１４で構成されているので、細胞培養容器１１０から発せられる蛍光を大幅に低減することができる。これにより培養細胞１２６の真の微弱蛍光強度を正確に測定することができるので、該底部１２０ｂを介して各凹部内の生きたままの培養細胞を、培養の過程を随時、例えば細胞内イオン測定装置、蛍光顕微鏡等で直接、測定、観察が適正に行なえる。

【００３０】ところで、無蛍光性を有する細胞培養容器は、例えば合成石英等の無蛍光性の材質が高価、割れ安く加工し難い等の理由から、通常、底板のみに無蛍光性の材質のものを用い、本体は孔が加工し易い、安価なプラスチック等の材質が用いられる。そして、これらを接着剤等により接着して多穴型の細胞培養容器を完成させるが、この多穴型細胞培養容器の作り方としては、一般に本体の各孔に底板を一枚ずつ接着する方法、本体の各孔に一枚の底板を接着する方法等が考えられる。

【００３１】しかしながら、本発明者らによれば、本体の各孔に底板を一枚ずつ接着する方法では、生産効率が悪く、コストが高くなり、一方、本体の各孔に一枚の底板を接着する方法では、本体と底板の間に接着剤から発生する小さな気泡が残る場合があり、凹部の側部と底部が完全密着の接着にはならない場合がある。このため、使用時、凹部から液漏れ等が発生する場合がある。また、余分な接着剤が凹部内へ流れ込む場合もあり、凹部での細胞の培養と培養細胞の観察が適正に行なえない場合があることを見つけた。

【００３２】そこで、本発明において特徴的なことは、これらの問題を一挙に解決するため、本体ないし底板の凹部を構成する部分と凹部を構成する部分の間に、該本体と該底板の間を固まっていない状態の接着剤で密着させた際、該本体と底板の間の気泡ないし余分な接着剤を該接着剤が固まる前に外部へ抜くことが可能な抜孔を設けたことである。

【００３３】このために本実施形態においては、本体１１２に、各凹部１２０の外周囲に沿って、例えば直径約３ｍｍ程度の気泡抜孔（抜孔）１３４を複数設けている。そして、図４に示すように本体１１２に接着剤１１６を、凹部１２０を構成する部分を除いて固まっていない状態で設けている。

【００３４】つぎに、図５（Ａ）に示すようにこのような本体１１２の上方より底板１１４を下降させ、同図

（Ｂ）に示すように本体１１２と底板１１４を密着させ、光学接着している。この結果、図６に示すように密着時、接着剤１１６はまだ固まっていないので、本体１１２と底板１１４の間の接着剤１１６から気泡１１８が発生しても、その気泡１１８は気泡抜孔１３４を介して外部に抜けるので、本体１１２と底板１１４を完全に密着させて接着することができる。これにより各凹部１２０の側部１２０ａと底部１２０ｂを完全に密着させて接着できるので、使用時、凹部１２０からの培養液等の漏れが完全に防げる。

【００３５】また、本体１１２と底板１１４の間に余分な接着剤１１６があっても、それらの密着時、気泡抜孔１３４を介して外部へ抜けるので、凹部１２０への接着剤１１６の流れ込みが大幅に低減される。これにより例えば接着剤１１６中に含まれる成分が培養液に溶け込むことによる培養細胞への悪影響が大幅に低減される。

【００３６】また、凹部１２０内に接着剤が付着することが大幅に低減されるので、測定時、接着剤１１６の成分がノイズとなって、細胞の測定結果に乗ってしまうことが大幅に低減される。これにより、このような接着時の工夫と、底板を実質的に蛍光性を有さない無蛍光性の材質で構成したことの相乗効果により、例えば凹部１２０での培養細胞の非常に弱い蛍光測定が該底部１２０ｂを介してより正確に行なえる。

【００３７】しかも、本実施形態では、加工がし易い、安価なプラスチックで構成された本体１１２に気泡抜孔１３４を設けているので、底板１１４に気泡抜孔を設けた場合に比較し加工コストが安くなる、割れるのを防げる、加工がし易い等の利点がある。

【００３８】また、本実施形態では、本体と底板を別個に構成しているため、底板の板厚を例えば０．１７ｍｍ以下等につくることも可能であるので、一般的な凹部の側部と底部を一体的に形成した細胞培養容器では困難であった、例えばレーザ共振点顕微鏡法等に本実施形態にかかる細胞培養容器１１０を適用することができる。

【００３９】さらに、本実施形態にかかる細胞培養容器１１０の底板１１４に用いられる合成石英板は、例えば３００ｎｍ以下等の波長の光であっても、その透過性に非常に優れているので、本実施形態にかかる細胞培養容器１１０を例えば３００ｎｍ以下等の波長での測定にも適用することができる。なお、本発明は前記構成に限定されず、発明の要旨の範囲内で種々の変形が可能である。

【００４０】例えば前記構成では、９６穴の多穴型細胞培養容器を例に説明したが、二以上の任意の数、例えば７２、４８、２４、１２、８穴等の多穴型細胞培養容器に適用可能である。

【００４１】また、前記構成では、低コスト化、細胞の微弱蛍光測定等がより正確に行なえる利点があるので、底板に無蛍光性の合成石英板等を用い、本体には安価、割れ難く加工し易いプラスチック製のものを用いた例について説明したが、本発明は、本体と底板の両方に無蛍光性の材質のものを用いること、また本体と底板の両方に無蛍光性以外の一般的な材質を用いる場合等にも適用可能である。例えば、前記構成では、本体に合成石英板を接着する例について説明したが、本体に例えばホウケイ酸ガラス等のカバーガラス等を接着する場合にも適用可能である。

【００４２】また、本実施形態では、本体上の底板を接着する部分を規定するように該本体には突起部１３６，１３８，１４０，１４２を設けている。この結果、本体上の突起部１３６，１３８，１４０，１４２により規定される部分に底板を載せるだけで、該本体の孔、気泡抜孔に対する底板の接着位置が自動的に設定されるので、このような突起部がない場合に比較し、本体に底板を接着する際の位置決めが非常に容易となる。

【００４３】また、本実施形態にかかる細胞培養容器を殺菌するため、使用前に、例えばその表面をＥＯＧ（エチレンオキシドグリコール）で処理することも好ましい。さらに、前記構成では、本体に気泡抜孔を設けた例について説明したが、本発明はこれに限定されるものではなく、接着する合成石英板、又はカバーガラス等の底板に気泡抜孔を設けてもよい。

【００４４】用途

本発明の多穴型細胞培養容器は、下記の利点があるので、以下の用途が一例として考えられる。

１．同一条件（一枚の合成石英板（底板）を介して各凹部での培養細胞を測定）で多くの細胞内微細構造や、微量物質の機能を比較測定することができる。

２．貴重な試料が微量で測定できる。

３．自動測定が可能である（マイクロプレートリーダ等を使用する）。

４．従来測定が不可能であった細胞内の微量蛍光標識物質の動態を、高感度定量測定が迅速に行なえる。

５．倍率の高い顕微鏡写真や、蛍光顕微鏡写真において、鮮明な写真が誰にでも撮影可能となる。

６．例えば培養細胞、浮遊細胞、組織細胞、レーザ共振点顕微鏡、細胞内イオン測定装置、蛍光画像解析等。

【００４５】市場性

本発明の多穴型細胞培養容器は、細胞微細構造並びに機能学的に研究の改良と発展性が期待されることから、下記の市場性が一例として考えられる。

１）細胞、免疫機能を分析

２）超微細機能／形態解析

３）環境科学解析等

４）脳及び代謝系疾患研究分野

５）遺伝子系研究分野等

【００４６】

【発明の効果】以上説明したように本発明にかかる細胞培養容器によれば、本体ないし底板の凹部を構成する部

分と凹部を構成する部分の間に設けられ、該本体と該底板の間を固まっていない状態の接着剤で密着させた際、該本体と該底板の間の気泡ないし余分な該接着剤を該接着剤が固まる前に外部へ抜くことが可能な抜孔を備えることとしたので、多穴型の製造が効率的に行なえ、且つ細胞の培養と観察が適正に行なえる。また、本発明においては、前記底板を光学的に透明な及び実質的に蛍光性を有さない材質で構成し、前記本体に前記抜孔を設けることにより、前記多穴型の製造がより容易に行なえ、且つ凹部の底部を介しての細胞の観察がより適正に行なえる。さらに、本発明においては、前記抜孔を、前記本体ないし底板に各凹部の外周囲に沿って設けることにより、前記細胞の培養と観察がより適正に行なえる。

【図面の簡単な説明】

【図１】従来の多穴型細胞培養容器の問題点の説明図である。

【図２】同図（Ａ）は本発明の一実施形態にかかる多穴型細胞培養容器の要部拡大図（縦断面図）、同図（Ｂ）は、同様の多穴型細胞培養容器の要部を上方より見た図である。

【図３】同図（Ａ）は本発明の一実施形態にかかる多穴型細胞培養容器の全体を上方より見た図、同図（Ｂ）は同様の多穴型細胞培養容器を側方より見た部分断面図である。

【図４】図３に示した多穴型細胞培養容器の本体に接着剤が設けられた状態を下方より見た図である。

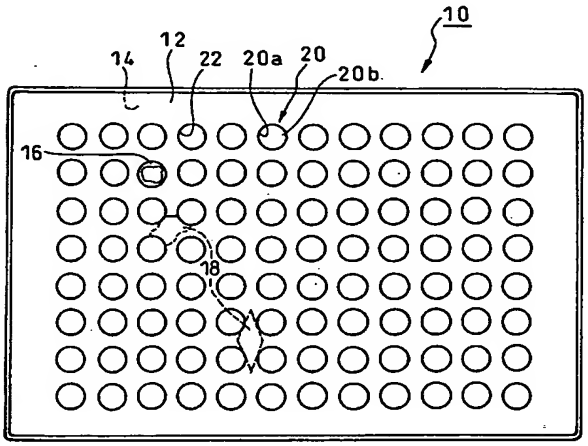
【図５】図３に示した多穴型細胞培養容器の本体と底板間の接着時の説明図である。

【図６】図３に示した多穴型細胞培養容器の作用効果の説明図である。

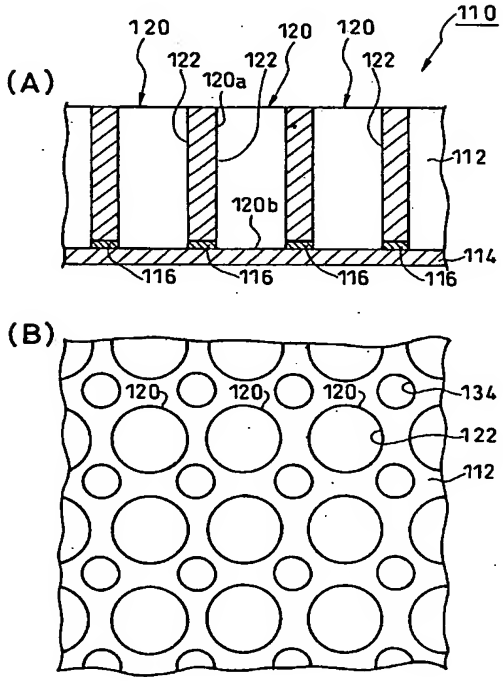
【符号の説明】

１１０　多穴型細胞培養容器（細胞培養容器）
１１２　本体
１１４　合成石英板（底板）
１１６　接着剤
１２０　凹部
１２０ａ　凹部側部
１２０ｂ　凹部底部
１２２　本体孔
１３４　気泡抜孔（抜孔）

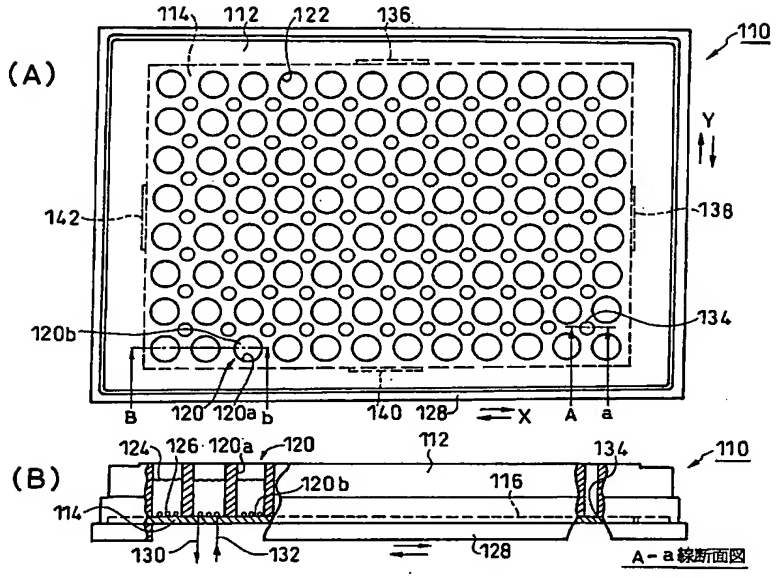
【図１】



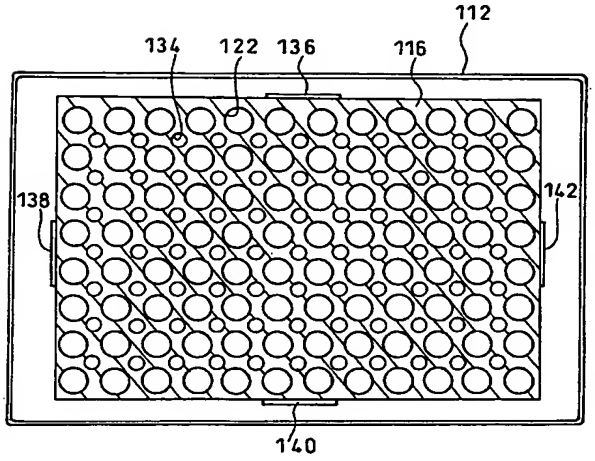
【図２】



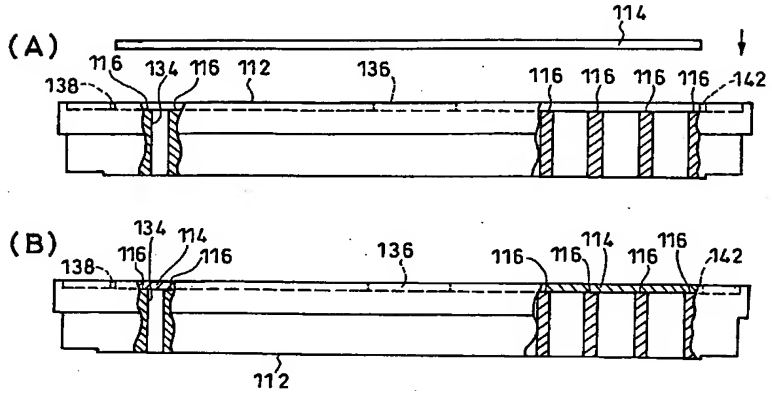
【図３】


(A)
114
112
122
136
110
Y
142
138
120b
134
B
120
120a
b
140
128
X
A
a
(B)
124
126
120a
120
112
134
110
120b
116
114
130
132
128
A－a線断面図

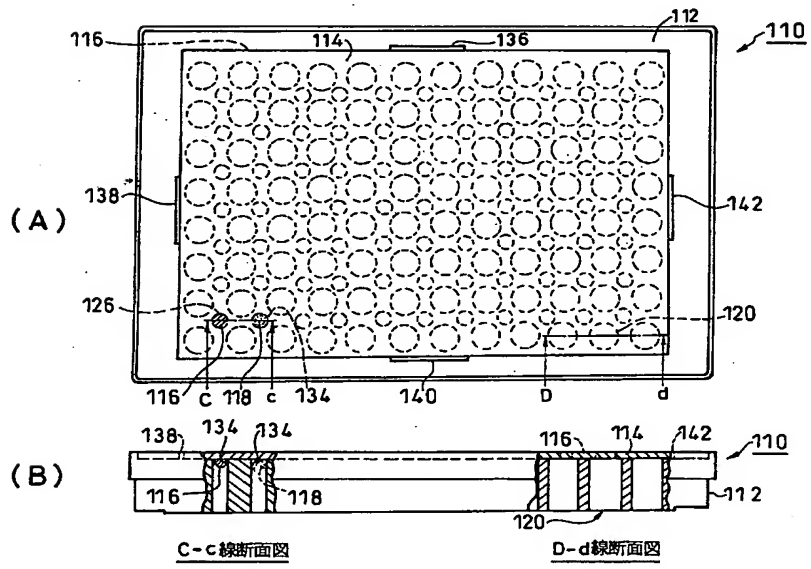
【図４】


112
134
122
136
116
138
142
140

【図５】



【図６】



フロントページの続き

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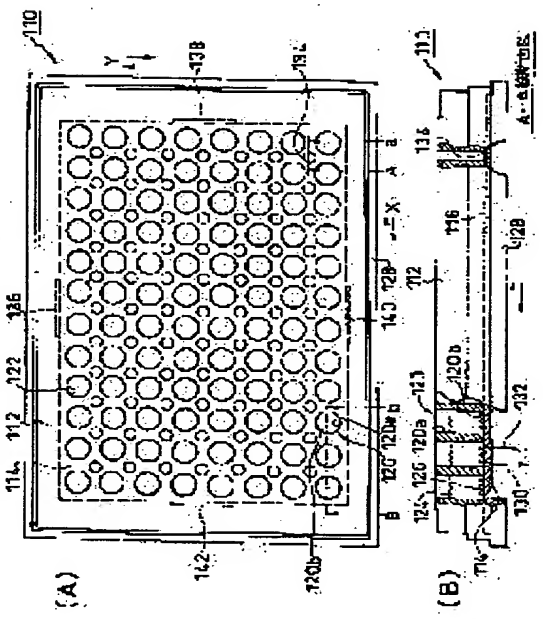
(54) CELL CULTURE CONTAINER

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a cell culture container having many concavities, capable of being efficiently produced and further capable of properly carrying out culture and observation of the cell.
SOLUTION: This cell culture container 110 is composed of the following: a main body 112 which has a plurality of openings 122; a piece of base plate 114 which is made of an optically transparent material and attached to the bottom of the main body 112 so that the openings 122 are closed to form concavities 120 each of which corresponds to each of the openings; an adhesive 116 which is applied to areas between the main body 112 and the base plate 114 but not applied to areas forming the concavities 120, before the adhesive is cured, and then fastens the main body 112 and the base plate 114 so as to prevent the concavities 120 from leaking liquid, after the adhesive is cured; and drainage holes 134 which are arranged between the areas forming the concavities 120 and used for outside discharging air bubbles, or an excessive amount of the adhesive 116 which has not been cured yet, of which the both exist between the main body 112 and the base plate 114, when the main body 112 and the base plate 114 are bonded with the adhesive 116 in a state of being not cured.



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[Date of final disposal for application]

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[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]
[Claim 1] The many hole type cell culture container which is characterized by providing the following and with which the cell was held and two or more crevices in which cultivation and observation of this cell are possible were prepared The main part with which two or more holes were prepared it constitutes from the transparent quality of the material optically -- having -- the lower part of the aforementioned main part -- the above -- each -- the bottom plate of one sheet prepared so that a hole might be embarrassed and each correspondence crevice might be constituted They are fixable adhesives so that a liquid spill may not produce this main part and this bottom plate in this crevice, after it was prepared in the state where it has not solidified between the aforementioned main part and the aforementioned bottom plate except for the portion which constitutes the aforementioned crevice and after that has solidified. **** which can extract the foam or these excessive adhesives between this main part and this bottom plate to the exterior before these adhesives become hard when it is prepared between the portion which constitutes the crevice of the aforementioned main part or a bottom plate, and the portion which constitutes a crevice and between this main part and these bottom plates is stuck with the aforementioned adhesives in the state where it has not solidified
[Claim 2] The cell culture container which constitutes the aforementioned bottom plate from the transparent quality of the material which reaches and does not have fluorescence nature substantially optically, prepares the aforementioned **** in the aforementioned main part in a cell culture container according to claim 1, and is characterized by performing observation of the cell in this crevice through the upper part twist of the aforementioned crevice, or a pars basilaris ossis occipitalis.
[Claim 3] It is the cell culture container characterized by preparing the aforementioned **** in the aforementioned main part or a bottom plate along the periphery enclosure of each aforementioned crevice in a cell culture container according to claim 1 or 2.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] this invention relates to improvement of the manufacture technique of a cell culture container, especially a many hole type cell culture container.
[0002]
[Description of the Prior Art] The many hole type container (microplate) is mainly used for fixed quantity measurement of a sample. The quality of the material consisted of the transparent quality of the materials optically, it is hard to be divided and was easy to process it, for example, in order to have used it as cheapness and a cell culture container which performs cultivation and observation of a cell since plastics, such as polystyrene and MC nylon, and hard glass are main, it was not satisfactory from a viewpoint of the accuracy of measurement.
[0003] That is, fluorescence is emitted although it is most common in the quality of the material of a cell culture container to use general plastics and hard glass, and these quality of the material itself is feeble. On the other hand, since the fluorescence intensity of the cultured cell itself was from the first very feeble, when measuring the feeble fluorescence of a cultured cell, the feeble fluorescence of this cultured cell and the fluorescence emitted from a cell culture container lapped, and the true fluorescence intensity of a cultured cell has not measured it correctly.
[0004] Moreover, in order for the flank and pars basilaris ossis occipitalis of a crevice to make the microplate formed in one, especially processing of a pars basilaris ossis occipitalis is difficult, and, for this reason, a certain case usually has much thickness of a pars basilaris ossis occipitalis 1mm or more. However, for example by the laser resonance point microscopic method, unless the thickness of a pars basilaris ossis occipitalis is 0.17 etc.mm or less etc., it may be unable to be used. Moreover, in the microplate of the above general plastics and the product made from hard glass, it does not let the light of wavelength, such as 300 etc.nm or less, pass in many cases, for example. However, it may be necessary to measure, for example on wavelength, such as 300 etc.nm or less.
[0005] By the way, there is an one hole type cell culture container which cultivation and observation of a cell made possible by making the flank and pars basilaris ossis occipitalis of a crevice separately, and constituting a pars basilaris ossis occipitalis from the quality of the material of non-fluorescence nature as a hint of the solution means of these problems. Usually, it is divided, and a non-fluorescence nature bottom plate is used only for a pars basilaris ossis occipitalis, it is hard to be divided, a flank is made from the quality of the materials, such as cheapness and plastics which is easy to process it, and, as for the cell culture container which has this one hole type non-fluorescence nature, a non-fluorescence nature bottom plate is built [adhesion fixation of these is carried out with adhesives, and] with the reason of being hard to process it at a low price a high price and often.
[0006] It becomes possible to measure more the feeble fluorescence emitted from the cultured cell in a crevice through a pars basilaris ossis occipitalis to accuracy by using the pars basilaris ossis occipitalis which cultivation and observing became easy, especially consisted of the quality

of the materials of non-fluorescence nature with this cell culture container. [of a cell]
[0007]
[Problem(s) to be Solved by the Invention] However, there was difficulty in applying to a many hole type cell culture container as it is about how to build the cell culture container of one hole type non-fluorescence nature. namely, -- as how to build a many hole type cell culture container -- a main part -- each -- the method of pasting up one bottom plate at a time on a hole, respectively, and a main part -- each -- how to paste up the bottom plate of one sheet on a hole etc. can be considered however, a main part -- each -- by the method of pasting up one bottom plate at a time on a hole, respectively, productive efficiency is bad and cost becomes high
[0008] on the other hand -- a main part -- each -- by the method of pasting up the bottom plate of one sheet on a hole, productive efficiency is very good and the thing of the uniform quality of the material can be pasted up Moreover, cost also has the advantage which can be reduced sharply. However, there were problems -- measurement may be unable to carry out proper -- putting into a container the cultured cell which a liquid spill produces in this case at the time of use and which cannot cultivate a cell good, and it was still unknown also about the cause.
[0009] It is in offering the cell culture container which this invention can be made in view of the technical problem of the aforementioned conventional technology, and the purpose can perform many hole type manufacture efficiently, and can perform cultivation and observation of a cell proper.
[0010]
[Means for Solving the Problem] This invention persons found that those causes were in the right and wrong of adhesion of a main part and a bottom plate, as a result of examining the aforementioned problem wholeheartedly. That is, a high price, since it is divided and is hard to process it at a low price, in case the quality of the material of non-fluorescence nature builds the many hole type cell culture container which has non-fluorescence nature, usually, the quality of the material of non-fluorescence nature is used only for a bottom plate, it is hard to be divided and the quality of the materials, such as cheapness and plastics which is easy to process it, are used for a main part. And how to paste up with adhesives and build these can be considered.
[0011] Drawing which looked at the conventional many hole type cell culture container 10 built by doing in this way from the upper part is shown in drawing 1 . At the time of adhesion of this main part 12 and a bottom plate 14, as shown in drawing 1 , the small air bubbles 18 may be generated from adhesives 16. If air bubbles 18 remain between a main part 12 and a bottom plate 14, flank 20a of the crevice 20 constituted with the hole 22 of a main part 12 and bottom 20b of the crevice 20 constituted by the bottom plate 14 may not become adhesion of full adhesion.
[0012] For this reason, it found that liquid spills, such as culture medium, etc. may occur from a crevice 20 at the time of use. Moreover, if the excessive adhesives 16 may flow in into a crevice 20 and adhesives 16 flow in into a crevice 20 at the time of this adhesion, at the time of cultivation, the component contained in adhesives 16 may melt into culture medium, and this may have a bad influence on cultivation of a cell.
[0013] Moreover, if adhesives 16 are on a crevice 20 at the time of measurement, with adhesives, cultivation area may become narrow and may become the hindrance of growth of a cell. And by this invention persons' removing outside the air bubbles generated from adhesives 16 at the time of adhesion of a main part 12 and a bottom plate 14, and removing excessive adhesives outside, and preventing flowing into a crevice It finds out that it can measure proper, putting the former very difficult liquid-spill prevention at the time of cultivation, good cultivation of a cell, and a cultured cell into a crevice, even if it was the case where how to build the cell culture container of one hole type non-fluorescence nature was applied to many holes, and came to complete this invention.
[0014] That is, the cell culture container applied to this invention in order to attain the aforementioned purpose is a many hole type cell culture container with which the cell was held and two or more crevices in which cultivation and observation of this cell are possible were

prepared, and is characterized by having a main part, the bottom plate of one sheet, adhesives, and ****. Here, as for the aforementioned main part, two or more holes are prepared.
[0015] moreover, the aforementioned bottom plate consists of the transparent quality of the materials optically — having — the lower part of the aforementioned main part — the above — each — a hole is embarrassed, and it is prepared so that each correspondence crevice may be constituted The aforementioned adhesives are formed in the state where it has not solidified between the aforementioned main part and the bottom plate except for the portion which constitutes the aforementioned crevice, and they make fixation possible so that a liquid spill may not produce this main part and this bottom plate in this crevice, after after that has solidified.
[0016] The aforementioned **** is prepared between the portion which constitutes the aforementioned crevice of the aforementioned main part or the aforementioned bottom plate, and the portion which constitutes the aforementioned crevice, and when sticking between this main part and these bottom plates with the aforementioned adhesives in the state where it has not solidified, it makes it possible to extract the air bubbles or these excessive adhesives between this main part and this bottom plate to the exterior, before these adhesives become hard. It is called the observation said here including the optical measurement by the optical measuring unit as well as viewing [lower part / the upper part of the bottom of a crevice, or], and microscope observation.
[0017] In this invention, since use of an organic solvent is also considered as culture medium, as adhesives, what does not melt into an organic solvent, for example, and the thing in which toxicity is not widely accepted to a cultured cell are desirable, for example, the thing which is the denaturation object of synthetic rubber and which made the methacrylic ester the principal component is mentioned as an example.
[0018] Moreover, when only these air bubbles may escape from the air bubbles or the excessive adhesives between the main parts and bottom plates which are said here when only air bubbles are generated as extracting outside, before adhesives become hard, or air bubbles are not generated, it also means that only excessive adhesives may fall out and both air bubbles and excessive adhesives fall out. In addition, in this invention, it is suitable that constitute the aforementioned bottom plate from the transparent quality of the material which reaches and does not have fluorescence nature substantially optically, prepare the aforementioned **** in the aforementioned main part, and observation of the cell in this crevice is performed through the upper part twist of the aforementioned crevice or a bottom.
[0019] Although the non-fluorescence nature said here is very ideal if fluorescence is not emitted at all, it is actually difficult to build that by which fluorescence is not emitted at all. For this reason, although fluorescence is emitted slightly, it says the grade which does not influence that this fluorescence intensity measures the true feeble fluorescence intensity of a cultured cell also including a very low thing. Compounding a silicon chloride according to a chemical process, for example from a natural silicon dioxide as the way of making, and making synthetic quartz by using the silicon chloride of this high grade as the main raw material is mentioned as an example.
[0020] thus, the built synthetic quartz has very low self-fluorescence as compared with general plastics and hard glass — in addition, since there is an advantage to which wavelength can also bear an intense temperature change with a very high light transmittance 190nm or more, it is desirable as the quality of the material of the cell culture container of this invention which performs cultivation and observation of a cell For example, as for the fluorescence intensity ratio of a crevice, 10% or less is mentioned as an example [incident-light intensity]. Moreover, in this invention, it is also suitable to prepare the aforementioned **** in the aforementioned main part or a bottom plate along the periphery enclosure of each crevice.
[0021]
[Embodiments of the Invention] The important section enlarged view (drawing of longitudinal section) of the many hole type cell culture container applied to 1 operation form of this invention at drawing 2 (A) and this drawing (B) are drawings which looked at the important section of the same many hole type cell culture container from the upper part. In addition, a sign 100 is added and shown in the aforementioned conventional technology and a corresponding portion, and

explanation is omitted.
[0022] the many hole type cell culture container 110 concerning this operation gestalt shown in this drawing -- a main part 112, a bottom plate 114, adhesives 116, and mind degassing -- it has a hole (****) 134 Here, the aforementioned main part 112 consists of the quality of the materials of polystyrene, and two or more holes 122 are formed. moreover, the aforementioned bottom plate 114 is optically transparent, and consists of synthetic quartz boards of non-fluorescence nature -- having -- the lower part of the aforementioned main part 112 -- the above -- each -- a hole 122 is embarrassed, and it is prepared so that each correspondence crevice 120 may be constituted
[0023] The aforementioned adhesives 116 are formed in the state where it has not solidified between the main part 112 and the bottom plate 114 except for the portion which constitutes this crevice 120, and they make fixation possible so that a liquid spill may not produce this main part 112 and this bottom plate 114 in this crevice 120, after after that has solidified. the aforementioned mind degassing -- a hole 134 is formed between the portion which constitutes the crevice 120 of a main part 112, and the portion which constitutes a crevice 120, and when sticking between this main part 112 and these bottom plates 114 with the adhesives 116 in the state where it has not solidified, before these adhesives 116 become hard, it makes the foam or the excessive adhesives between this main part 112 and a bottom plate 114 possible [extracting to the exterior]
[0024] and the foam which the aforementioned adhesives 116 made stick a bottom plate 114 to a main part 112, and was produced between this main part 112 and the bottom plate 114 and the excessive adhesives 116 -- the aforementioned mind degassing -- after escaping from a hole 134 to the exterior, what is hardened by optical irradiation for a short time is used, and optical adhesion of a main part 112 and the bottom plate 114 is carried out Drawing which next looked at the whole many hole type cell culture container concerning 1 operation gestalt of this invention from the upper part to drawing 3 (A) is shown, and the fragmentary sectional view which looked at the same many hole type cell culture container from the side is shown in this drawing (B).
[0025] About 127.6mm and the direction of a short hand consist of [an appearance] about about 85.3mm for a longitudinal direction, and, as for the many hole type cell culture container 110 applied to this operation gestalt as shown in this drawing, two or more crevices 120 are formed. the diameter of about about 6.45mm for which flank 120a of each of this crevice 120 was prepared in the polystyrene bookbinding object 112 -- each -- it is constituted by the hole 122 and, as for the pars-basilaris-ossis-occipitalis 120b, board thickness consists of one non-fluorescence nature synthetic quartz board (bottom plate) 114 which is about about 0.15mm
[0026] In each of this crevice 120, it is filled with culture medium 124 and a cell 126 is cultivated in each crevice 120. And, of course, when cultivation of a cell is completed, even if it is in the middle of the cultivation, it becomes possible to put the cell culture container 110 concerning this operation gestalt, for example on the sample base 128 of the ion measuring device in a cell as it is, for example, to measure the calcium ion concentration of the cultured cell 126 in each crevice 120 etc. one by one. That is, the sample base 128 sets each crevice 120 on the optical path which can move now the many hole type cell culture container 110 concerning this operation gestalt for example, in the XY direction, and serves as a predetermined measuring point, and measures the cultured cell 126 in each of this crevice 120 one by one.
[0027] For example, incidence of the excitation light 130 of the predetermined wavelength from the optical irradiation means (illustration ellipsis) of the ion measuring device in a cell is carried out from the lower part of the cell culture container 110, and it is irradiated through the bottom plate 114 by the cultured cell 126 in a crevice 120. Then, incidence of the fluorescence 132 by which fluorescence was emitted from the cultured cell 126, among those outgoing radiation was caudad carried out through the bottom plate 114 is carried out to a latter detection means (illustration ellipsis), and well-known signal processing is performed, for example, the calcium ion concentration in the cultured cell 126 in this crevice 120 etc. is measured.
[0028] Subsequently, by moving in the sample base 128, measuring by making it located on the optical path for the aforementioned measurement of other crevices, for example, the crevice of a

next door on the same level, repeating this operation about two or more crevices, and performing it Since the exchange work of a container etc. is excluded as compared with the case where it measures exchanging two or more one hole type cell culture containers, even if it is measurement of the crevice of the same number, the work can carry out more efficiently.
[0029] Here, since the bottom plate 114 which constitutes pars-basilaris-ossis-occipitalis 120b of each crevice 120 consists of synthetic quartz boards 114 which do not have fluorescence nature substantially, it can reduce sharply the fluorescence emitted from the cell culture container 110. Since the true feeble fluorescence intensity of a cultured cell 126 can be measured correctly by this, measurement and observation can perform process of cultivation for a cultured cell [having lived in each crevice through this pars-basilaris-ossis-occipitalis 120b] proper directly with the ion measuring device in at any time, for example, a cell, a fluorescence microscope, etc.
[0030] By the way, it is divided, and from the reason of being hard to process it at a low price, usually, the thing of the quality of the material of non-fluorescence nature is used only for a bottom plate, and, as for the cell culture container which has non-fluorescence nature, the quality of the materials, such as a high price and cheap plastics into which a hole tends to process a main part, are used for the quality of the material of non-fluorescence nature, such as synthetic quartz. and — as how to make this many hole type cell culture container, although these are pasted up with adhesives etc. and a many hole type cell culture container is completed — general — a main part — each — the method of pasting up one bottom plate at a time on a hole, and a main part — each — how to paste up the bottom plate of one sheet on a hole etc. can be considered
[0031] however — according to this invention persons — a main part — each — the method of pasting up one bottom plate at a time on a hole — productive efficiency — bad — cost — high — becoming — on the other hand — a main part — each — by the method of pasting up the bottom plate of one sheet on a hole, the small foam generated from adhesives may remain between a main part and a bottom plate, and the flank and pars basilaris ossis occipitalis of a crevice may not become adhesion of full adhesion For this reason, a liquid spill etc. may occur from a crevice at the time of use. Moreover, it found that excessive adhesives may flow in into a crevice and cultivation of the cell in a crevice and observation of a cultured cell may be unable to carry out proper.
[0032] Then, it being characteristic in this invention is having prepared **** which can extract the foam or the excessive adhesives between this main part and a bottom plate to the exterior before these adhesives' become hard, when sticking between this main part and these bottom plates with the adhesives in the state where it has not solidified, between the portion which constitutes the crevice of a main part or a bottom plate, and the portion which constitutes a crevice, in order to solve these problems at once.
[0033] for this reason, this operation gestalt — setting — a main part 112 — the periphery enclosure of each crevice 120 — meeting — for example, mind degassing with a diameter of about about 3mm — two or more holes (****) 134 are formed And as shown in drawing 4 , it has prepared in the main part 112 in the state where the crevice 120 is not solidified in adhesives 116 except for the portion to constitute.
[0034] Next, as shown in drawing 5 (A), a bottom plate 114 is dropped from the upper part of such a main part 112, as shown in this drawing (B), a main part 112 and a bottom plate 114 are stuck, and optical adhesion is carried out. consequently — since adhesives 116 have not become hard yet at the time of adhesion as shown in drawing 6 , even if a foam 118 is generated from the adhesives 116 between a main part 112 and a bottom plate 114 — the foam 118 — mind degassing — since it escapes outside through a hole 134, a main part 112 and a bottom plate 114 can be stuck completely, and it can paste up Since flank 120a and pars-basilaris-ossis-occipitalis 120b of each crevice 120 are stuck completely by this and it can paste up, the leakage of the culture medium from a crevice 120 etc. can be completely prevented at the time of use.
[0035] moreover — even if the excessive adhesives 116 are between a main part 112 and a bottom plate 114 — the time of those adhesion — mind degassing — since it escapes to the

exterior through a hole 134, the influx of the adhesives 116 to a crevice 120 is reduced sharply The bad influence to the cultured cell by the component contained, for example in adhesives 116 by this melting into culture medium is reduced sharply.

[0036] Moreover, since it is reduced sharply that adhesives adhere in a crevice 120, the component of adhesives 116 serving as a noise and riding on the measurement result of a cell is sharply reduced at the time of measurement. Thereby, the very weak fluorescent light measurement of the cultured cell in a crevice 120 can carry out to accuracy more through this pars-basilaris-ossis-occipitalis 120b according to the device at the time of such adhesion, and the synergistic effect of having constituted the bottom plate from the quality of the material of the non-fluorescence nature which does not have fluorescence nature substantially.

[0037] and the main part 112 which processing tends to carry out with this operation gestalt and which consisted of cheap plastics -- mind degassing -- since the hole 134 is formed -- a bottom plate 114 -- mind degassing -- as compared with the case where a hole is prepared, there is an advantage to which processing cost becomes cheap, like that it can protect and processing tends to carry out being divided

[0038] Moreover, with this operation gestalt, since the main part and the bottom plate are constituted separately, since building to 0.17 etc.mm or less etc. is also possible, with the cell culture container which formed the flank and pars basilaris ossis occipitalis of a general crevice in one, it was difficult, for example, the cell culture container 110 applied to this operation gestalt at a laser resonance point microscopic method etc. can be applied for the board thickness of a bottom plate.

[0039] Furthermore, since it excels in the permeability very much even if it is the light of wavelength, such as 300 etc.nm or less, the synthetic quartz board used for the bottom plate 114 of the cell culture container 110 concerning this operation gestalt can apply the cell culture container 110 concerning this operation gestalt also to measurement on wavelength, such as 300 etc.nm or less. In addition, this invention is not limited to the aforementioned composition, but deformation various by within the limits of the summary of invention is possible for it.

[0040] For example, with the aforementioned composition, although the many hole type cell culture container of 96 holes was explained to the example, it is applicable to many hole type cell culture containers, such as two or more arbitrary numbers, 72, 48, 24, and 12, and eight holes. [for example,]

[0041] Moreover, since there was an advantage which the feeble fluorescent light measurement of low-cost-izing and a cell etc. can perform to accuracy more, although it used the synthetic quartz board of non-fluorescence nature etc. for the bottom plate and cheapness and the example using the thing made from plastics which cannot break easily and is easy to process it were explained to the main part with the aforementioned composition this invention can be applied when using the general quality of the materials other than non-fluorescence nature for both using the thing of the quality of the material of non-fluorescence nature for both a main part and a bottom plate and a main part, and a bottom plate. For example, although the aforementioned composition explained the example which pastes up a synthetic quartz board on a main part, when pasting up cover glass, such as borosilicate glass, etc. on a main part, it can apply.

[0042] Moreover, with this operation gestalt, the height 136,138,140,142 is provided in this main part so that the portion which pastes up the bottom plate on a main part may be specified. consequently, only putting a bottom plate on the portion specified by the height 136,138,140,142 on a main part -- the hole of this main part, and mind degassing -- since the adhesion position of the bottom plate to a hole is set up automatically, as compared with the case where there is such no height, positioning at the time of pasting up a bottom plate on a main part becomes very easy

[0043] Moreover, in order to sterilize the cell culture container concerning this operation gestalt, it is also desirable to process the front face by ethylene oxide gas (ethylene oxide glycol) before use, for example. furthermore -- the aforementioned composition -- a main part -- mind degassing -- bottom plates, such as a synthetic quartz board which this invention is not limited to this and pasted up although the example which prepared the hole was explained, or cover

glass, — mind degassing — you may prepare a hole
[0044] Since the many hole type cell culture container of a use this invention has the following advantage, the following uses are considered as an example.
1. Many fine structures in a cell and the function of the minute amount matter can be compared on the same conditions (the cultured cell in each crevice is measured through one synthetic quartz board (bottom plate)).
2. A precious sample can measure in a minute amount.
3. It can measure automatically (a microplate reader etc. is used).
4. High sensitivity fixed quantity measurement can perform quickly the moving state of the minute amount fluorescent-labeling matter in the cell which was not able to be measured conventionally.
5. In a highly competitive microphotography and a fluorescence microscope photograph, photography of a clear photograph is attained at anyone.
6. For example, cultured cell, suspension cell, tissue cell, laser resonance point microscope, ion measuring device in cell, fluorescence image analysis, etc.
[0045] The marketability of the following [container / many hole type cell culture / of a marketability this invention / expect / improvement and possibilities of research / in functional study / the cell fine structure and] is considered as an example.
1) a cell and an immunity function — analysis 2 — super- — four brains, such as a detailed function / gestalt analysis 3 environmental-science analysis, a metabolic system disorder research field 5 genetic-system research field [0046], etc.
[Effect of the Invention] According to the cell culture container applied to this invention as explained above, it is prepared between the portion which constitutes the crevice of a main part or a bottom plate, and the portion which constitutes a crevice. When sticking between this main part and these bottom plates with the adhesives in the state where it has not solidified, since it has **** which can extract the foam or these excessive adhesives between this main part and this bottom plate to the exterior before these adhesives become hard Many hole type manufacture can be performed efficiently, and cultivation and observation of a cell can be performed proper. Moreover, in this invention, the observation of a cell whose aforementioned many hole type manufacture can carry out more easily, and minds the pars basilaris ossis occipitalis of a crevice can carry out more proper by constituting the aforementioned bottom plate from the transparent quality of the material which reaches and does not have fluorescence nature substantially optically, and preparing the aforementioned **** in the aforementioned main part. Furthermore, in this invention, cultivation and observation of the aforementioned cell can carry out more proper by preparing the aforementioned **** in the aforementioned main part or a bottom plate along the periphery enclosure of each crevice.

[Translation done.]